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concluded

operatively associated with the detector produces output data indicative of a lattice characteristic of the specimen being tested.

In the Specification:

5 **Please replace paragraph 0010 on page 5 with the following rewritten paragraph:**

10 [0010] Non-destructive testing apparatus according to one
 embodiment of the invention comprises a photon source. The
 photon source produces photons having predetermined energies and
 directs the photons toward a specimen being tested. The photons
 from the photon source result in the creation of positrons within
 the specimen being tested. A detector positioned adjacent the
 specimen being tested detects gamma rays produced by annihilation
 of positrons with electrons. A data processing system
15 operatively associated with the detector produces output data
 indicative of a lattice characteristic of the specimen being
 tested.

✓ **Please delete paragraph 0011 on page 5.**

In the Claims:

20 **Please replace claim 20 with the following rewritten claim:**

25 20. Non-destructive testing apparatus, comprising:
 a photon source, said photon source producing photons
 having a predetermined energy and directing the photons
 toward a specimen being tested, the photons from said
 photon source resulting in the creation of positrons within
 the specimen being tested;
 a detector positioned adjacent the specimen being
 tested, said detector producing raw data indicative of a
 positron annihilation event; and
30 a data processing system operatively associated with
 said detector and said photon source, said data processing
 system operating in accordance with a normal

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activation/analysis process when a half-life of a selected
positron emitter within the specimen being tested is
greater than a predetermined half-life, said data
processing system operating in accordance with a rapid
activation/analysis process when a half-life of the
selected positron emitter within the specimen being tested
is less than the predetermined half-life, said data
processing system, when operating in accordance with the
rapid activation/analysis process, alternatively activating
said photon source and detecting raw data indicative of a
positron annihilation event, said data processing system
including a Doppler broadening algorithm, said Doppler
broadening algorithm processing raw data indicative of a
positron annihilation event to produce output data
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indicative of a lattice characteristic of the specimen
being tested.

✓ Please cancel claim 25 without prejudice to the subject
matter contained therein.

Please replace claim 26 with the following rewritten claim:

20 26. (Amended) Non-destructive testing apparatus,
comprising:

positron activation means for activating a positron
emitter within a specimen being tested;

25 detector means for detecting a positron annihilation
event within the specimen being tested and for producing
raw data indicative of the positron annihilation event;

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means for alternately activating the positron emitter
within the specimen being tested and detecting a positron
annihilation event; and

30 data processing means operatively associated with said
detector means, said data processing means processing raw
data indicative of the positron annihilation event in
accordance with a Doppler broadening algorithm to produce